Discovering Computers 2016

Tools, Apps, Devices, and the Impact of Technology

Chapter 9

Operating Systems

Objectives Overview

Explain the purpose of an operating system

Describe the start-up process and shutdown options on computers and mobile devices

Explain how an operating system provides a user interface, manages programs, manages memory, and coordinates tasks

Describe how an operating system enables users to configure devices, establish an Internet connection, and monitor performance

Identify file management and other tools included with an operating system, along with ways to update operating system software

See Page 410
for Detailed Objectives

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Objectives Overview

Explain how an operating system enables users to control a network or administer security

Summarize the features of several desktop operating systems

Briefly describe various server operating systems

Summarize the features and uses of several mobile operating systems

See Page 410
for Detailed Objectives

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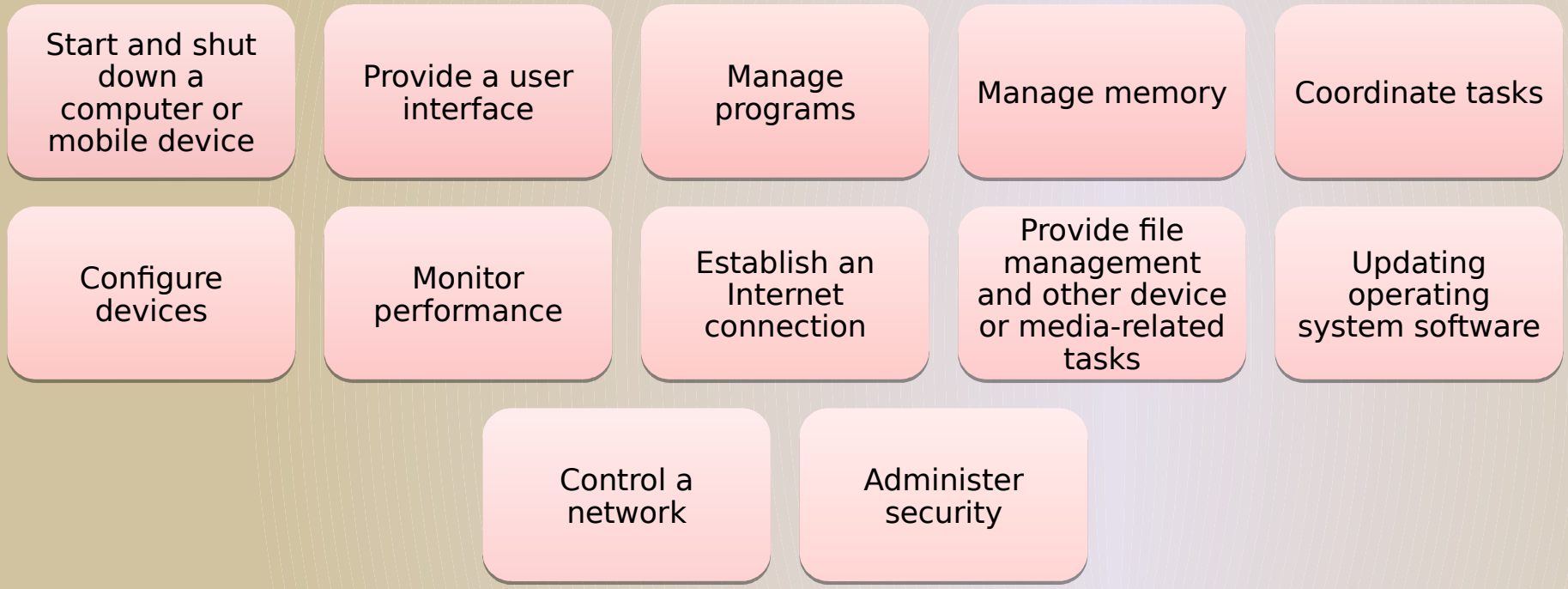
Operating Systems

- An **operating system** (**OS**) is a set of programs that coordinate all the activities among computer or mobile device hardware



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Operating Systems

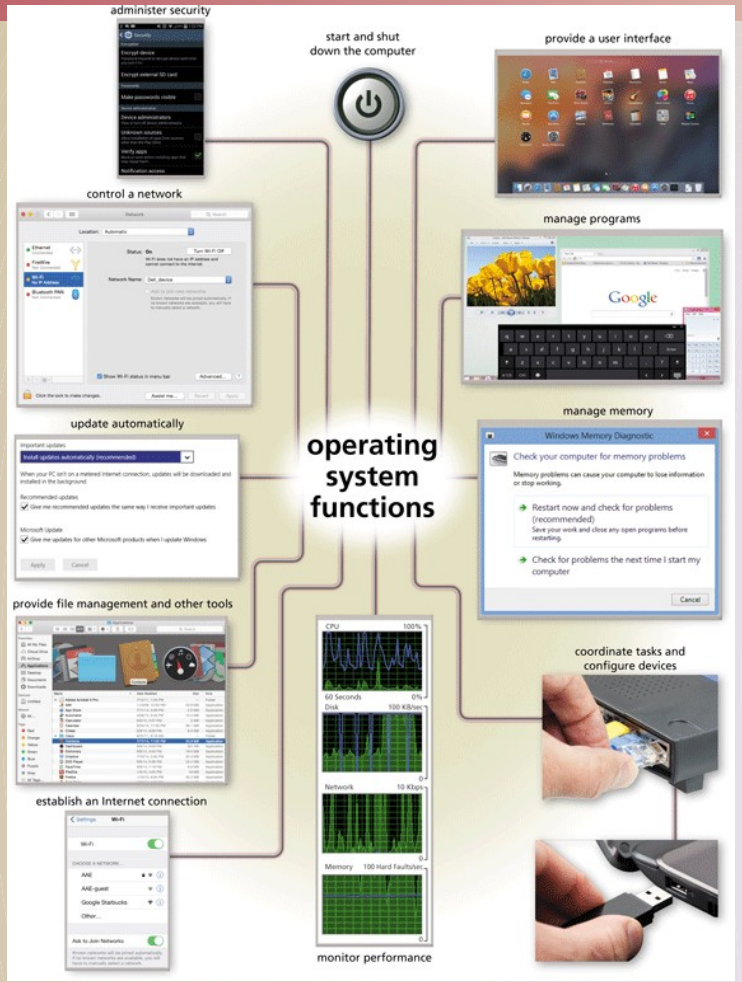

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Figure 9-1

Operating System Functions

- Starting Computers and Mobile Devices
  - If a computer or mobile device is off, you press a power button to turn it on

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Figure 9-2

Operating System Functions

- An operating system includes various power options

Sleep mode saves any open documents running programs or apps to RAM, turns off all unneeded functions, and then places the computer in a low-power state

Hibernate mode saves any open documents and running programs or apps to an internal hard drive before removing power from the computer or device

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Operating System Functions

- A **user interface** (**UI**) controls how you enter data and instructions and how information is displayed on the screen
- With a graphical user interface (GUI), you interact with menus and visual images

Pages 413– 414
Figure 9-3

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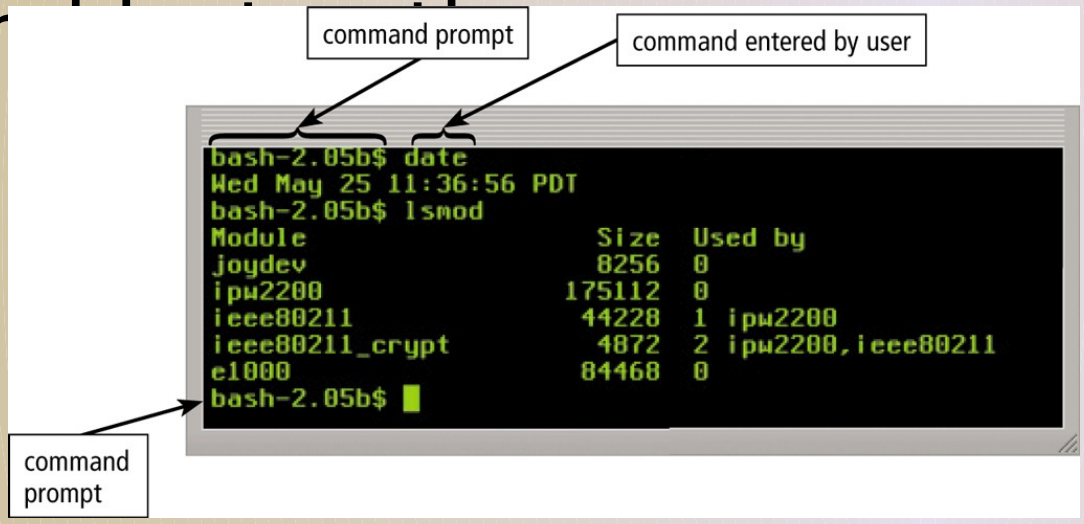
Operating System Functions

- In a command-line interface, a user types commands represented by short keywords or abbreviations or presses special keys on the keyboard to enter data ar



Pages 414 - 415
Figure 9-4

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Operating System Functions

- How an operating system handles programs directly affects your productivity

Single tasking and multitasking

Foreground and background

Single user and multiuser

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Operating System Functions

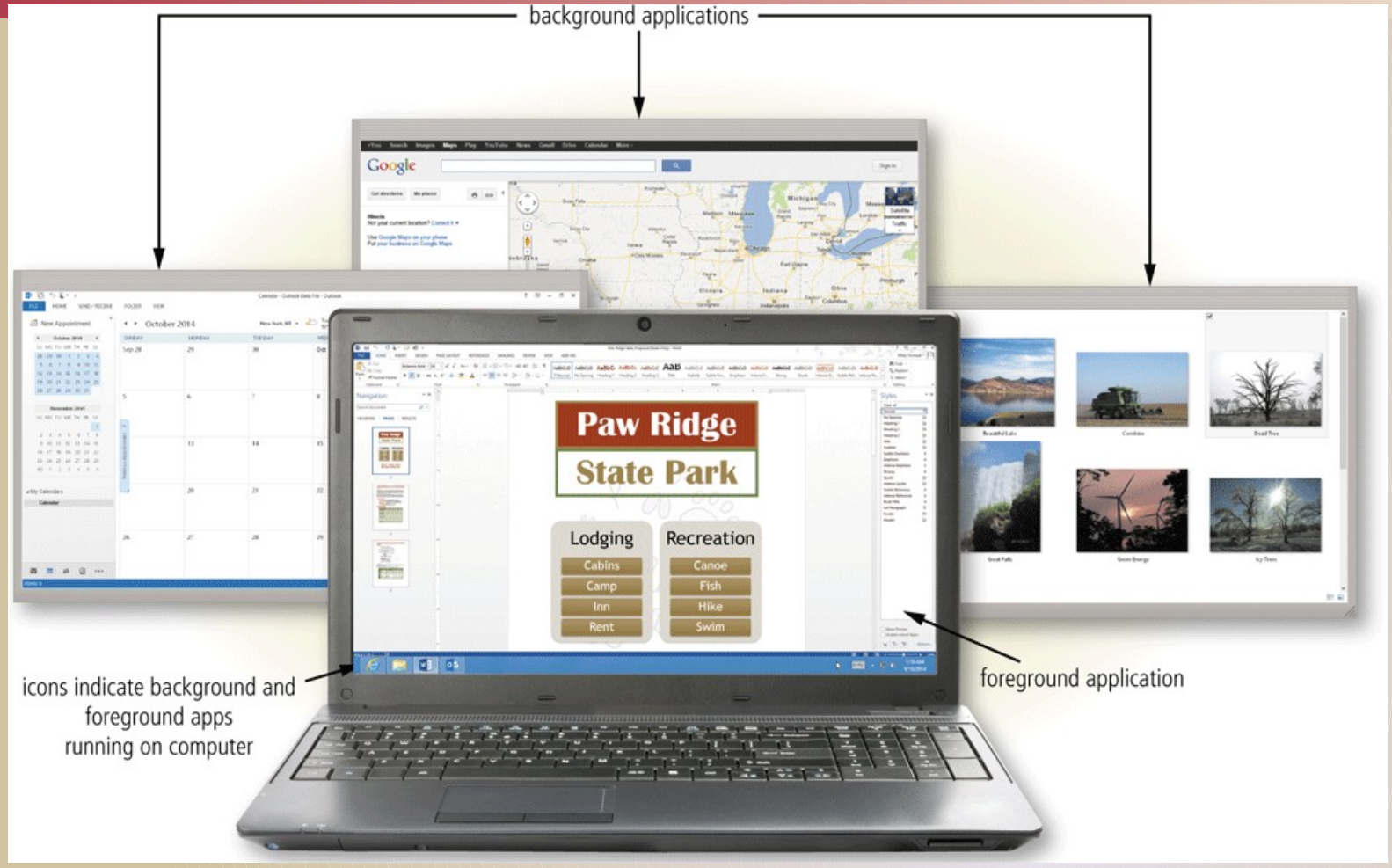

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Figure 9-5

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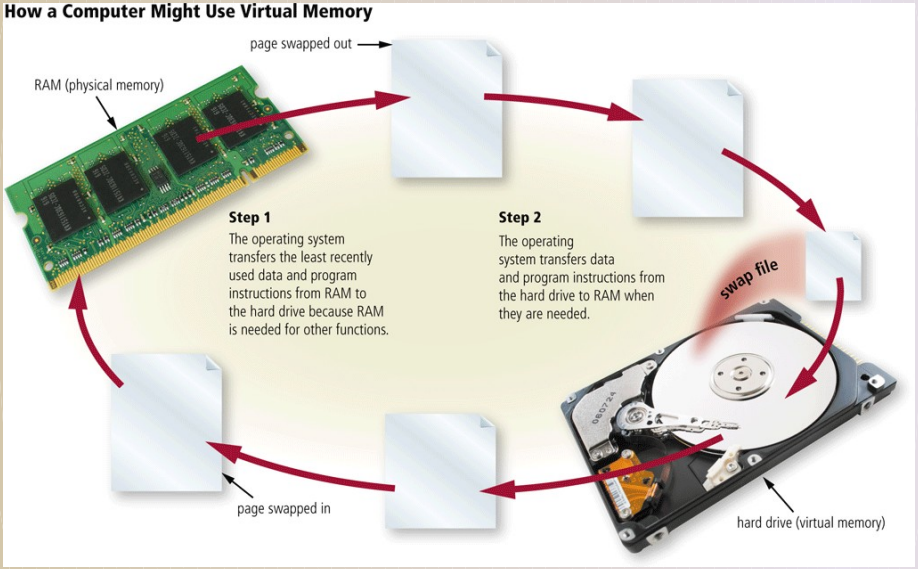
Operating System Functions

- Memory management optimizes the use of the computer or device's internal memory
- **Virtual memory** is a portion of a storage medium functioning as additional RAM


How a Computer Might Use Virtual Memory
page swapped out
RAM (physical memory)
Step 1
The operating system transfers the least recently used data and program instructions from RAM to the hard drive because RAM is needed for other functions.
Step 2
The operating system transfers data and program instructions from the hard drive to RAM when they are needed.
swap file
page swapped in
hard drive (virtual memory)

Pages 416 - 417
Figure 9-8

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Operating System Functions

- The operating system determines the order in which tasks are processed

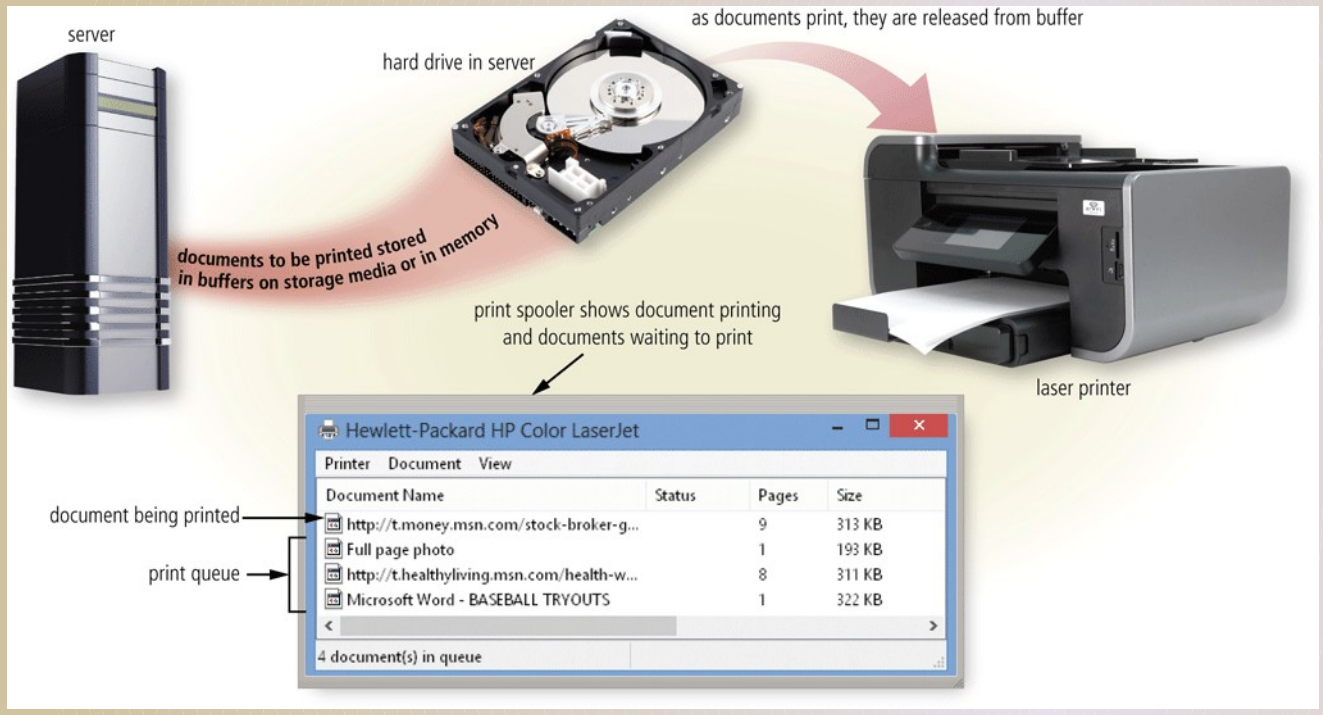
server
hard drive in server
as documents print, they are released from buffer
documents to be printed stored in buffers on storage media or in memory
print spooler shows document printing and documents waiting to print
laser printer
Hewlett-Packard HP Color LaserJet
Printer Document View
Document Name Status Pages Size
http://t.money.msn.com/stock-broker-g... 9 313 KB
Full page photo 1 193 KB
http://t.healthyliving.msn.com/health-w... 8 311 KB
Microsoft Word - BASEBALL TRYOUTS 1 322 KB
4 document(s) in queue
document being printed
print queue

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Figure 9-9

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Operating System Functions

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Operating System Functions

- A **performance monitor** is a program that assesses and reports information about various computer resources and devices

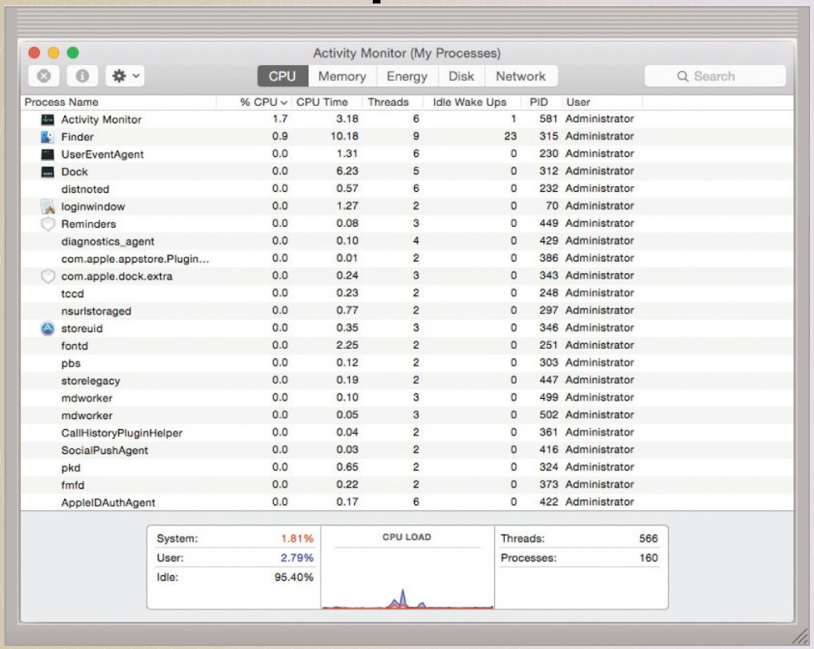
Activity Monitor (My Processes)
CPU
Memory
Energy
Disk
Network
Search
Process Name
% CPU
CPU Time
Threads
Idle Wake Ups
PID
User
Activity Monitor 1.7 3.18 6 1 581 Administrator
Finder 0.9 10.18 9 23 315 Administrator
UserEventAgent 0.0 1.31 6 0 230 Administrator
Dock 0.0 6.23 5 0 312 Administrator
distnoted 0.0 0.57 6 0 232 Administrator
loginwindow 0.0 1.27 2 0 70 Administrator
Reminders 0.0 0.08 3 0 449 Administrator
diagnostics_agent 0.0 0.10 4 0 429 Administrator
com.apple.appstore.Plugin... 0.0 0.01 2 0 386 Administrator
com.apple.dock.extra 0.0 0.24 3 0 343 Administrator
tccd 0.0 0.23 2 0 248 Administrator
nsurlstoraged 0.0 0.77 2 0 297 Administrator
storeuid 0.0 0.35 3 0 346 Administrator
fontd 0.0 2.25 2 0 251 Administrator
pbs 0.0 0.12 2 0 303 Administrator
storelegacy 0.0 0.19 2 0 447 Administrator
mdworker 0.0 0.10 3 0 499 Administrator
mdworker 0.0 0.05 3 0 502 Administrator
CallHistoryPluginHelper 0.0 0.04 2 0 361 Administrator
SocialPushAgent 0.0 0.03 2 0 416 Administrator
pkd 0.0 0.65 2 0 324 Administrator
fmfd 0.0 0.22 2 0 373 Administrator
AppleIDAuthAgent 0.0 0.17 6 0 422 Administrator
System: 1.81%
User: 2.79%
Idle: 95.40%
CPU LOAD
Threads: 566
Processes: 160

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Figure 9-10

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Operating System Functions

- Operating systems typically provide a means to establish Internet connections

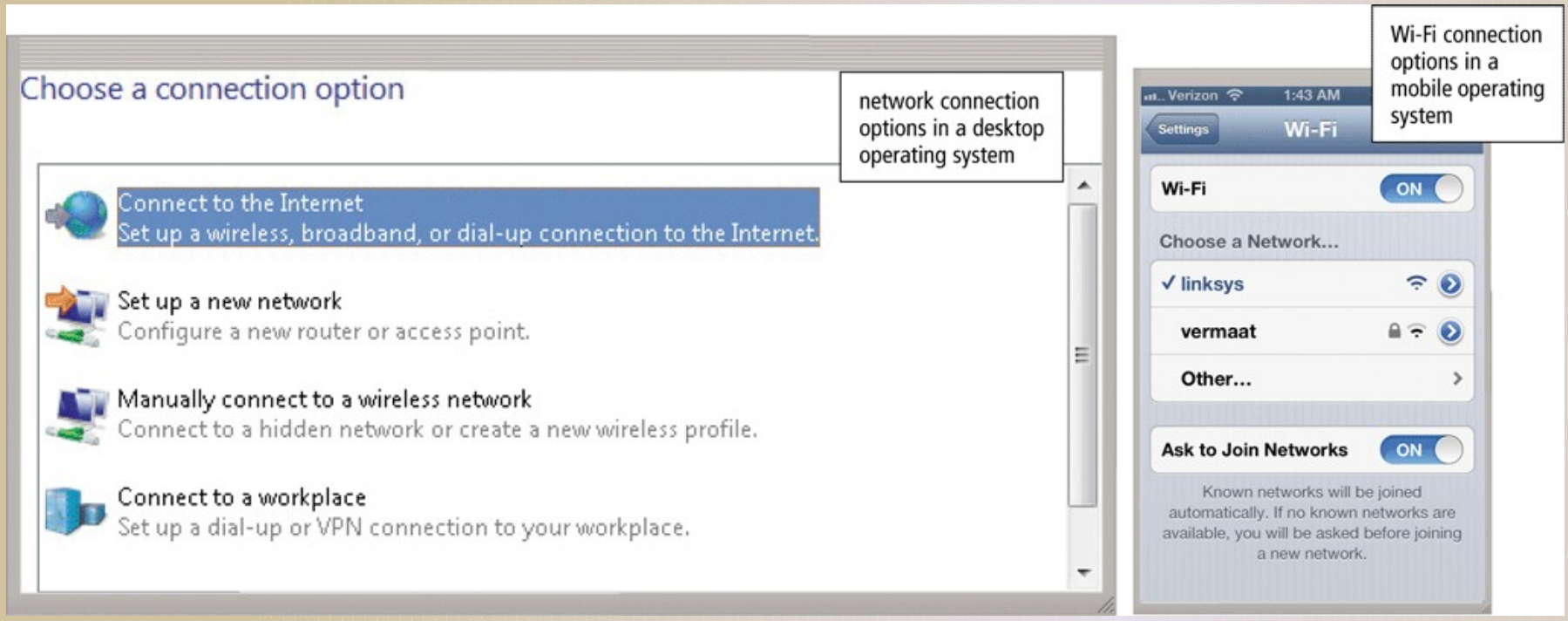
Choose a connection option
network connection options in a desktop operating system
Connect to the Internet
Set up a wireless, broadband, or dial-up connection to the Internet.
Set up a new network
Configure a new router or access point.
Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.
Connect to a workplace
Set up a dial-up or VPN connection to your workplace.
Wi-Fi connection options in a mobile operating system
Verizon
1:43 AM
Settings
Wi-Fi
Wi-Fi
ON
Choose a Network...
linksys
vermaat
Other...
Ask to Join Networks
ON
Known networks will be joined automatically. If no known networks are available, you will be asked before joining a new network.

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Figure 9-11

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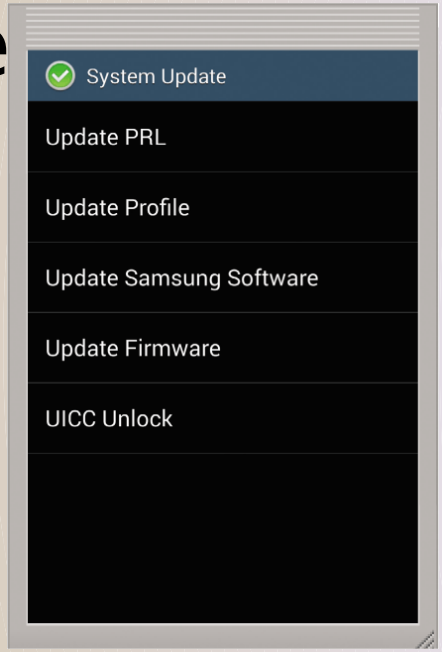
Operating System Functions

- Many programs, including operating systems, include an **automatic update** feature that regularly provides new features or corre he program



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Operating System Functions

- Operating systems often provide users with a variety of tools related to managing a computer, its devices, or its programs

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Operating System Functions

- Some operating systems are designed to work with a server on a network
- These multiuser operating systems allow multiple users to share a printer, Internet access, files, and programs
- A network administrator uses the server operating system to:
  - Add and remove users, computers, and other devices
  - Configure the network, install software and administer network security

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Operating System Functions

- A user account enables a use to **sign in** to, or access resources on, a network or computer
  - A **user name**, or user ID, identifies a specific user
  - A **password** is a private combination of characters associated with the

Pages 423 - 424
Figure 9-13

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Types of Operating Systems

Table 9-2	Examples of Operating Systems by Category
Category	**Name**
Desktop	Windows
	OS X
	UNIX
	Linux
	Chrome OS
Server	Windows Server
	Mac OS X Server
	UNIX
	Linux
Mobile	Google Android
	Apple iOS
	Windows Phone

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Desktop Operating Systems

- A **desktop operating system** is a complete operating system that works on desktops, laptops, and some tablets

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Desktop Operating Systems

- The latest versions of Windows offer these features
  - Uses tiles to access apps
  - Includes the desktop interface
  - Support for input via touch, mouse, and keyboard
  - Email app, calendar app, and browser included
  - Photos, files, and settings you can sync with OneDrive
  - Enhanced security through an antivirus program, firewall, and automatic updates
  - Windows Store offers additional applications for purchase

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Desktop Operating Systems

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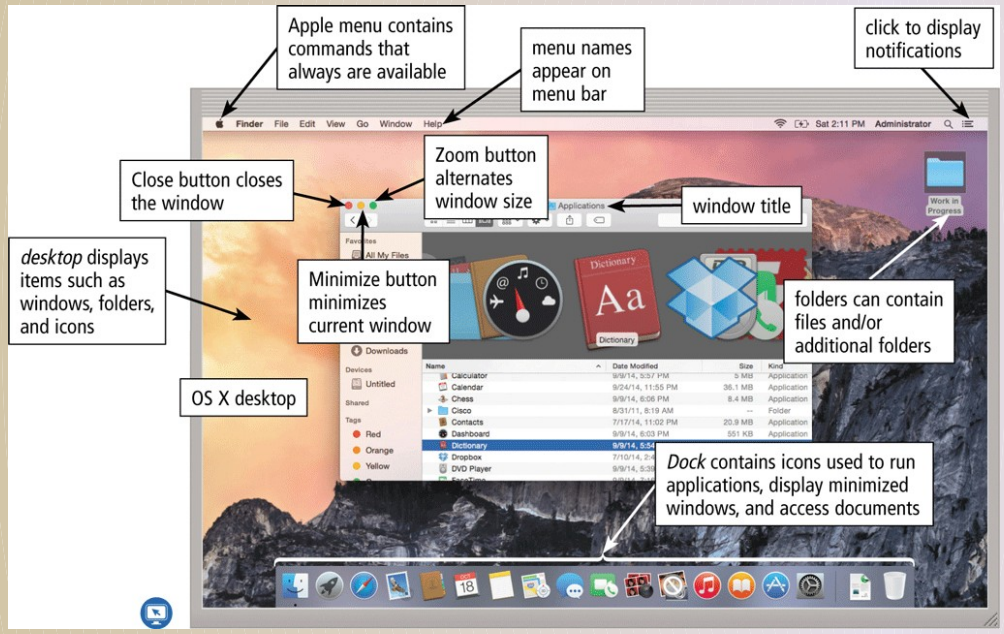
Desktop Operating Systems

- The Macintosh operating system has earned a reputation for its ease of use
- Latest version is **OS X**


Apple menu contains commands that always are available
menu names appear on menu bar
click to display notifications
Close button closes the window
Zoom button alternates window size
window title
desktop displays items such as windows, folders, and icons
Minimize button minimizes current window
folders can contain files and/or additional folders
OS X desktop
Dock contains icons used to run applications, display minimized windows, and access documents

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Desktop Operating Systems

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Figures 9-14 – 9-15

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Desktop Operating Systems

- **Chrome OS** is a Linux-based operating system designed to work primarily with web a

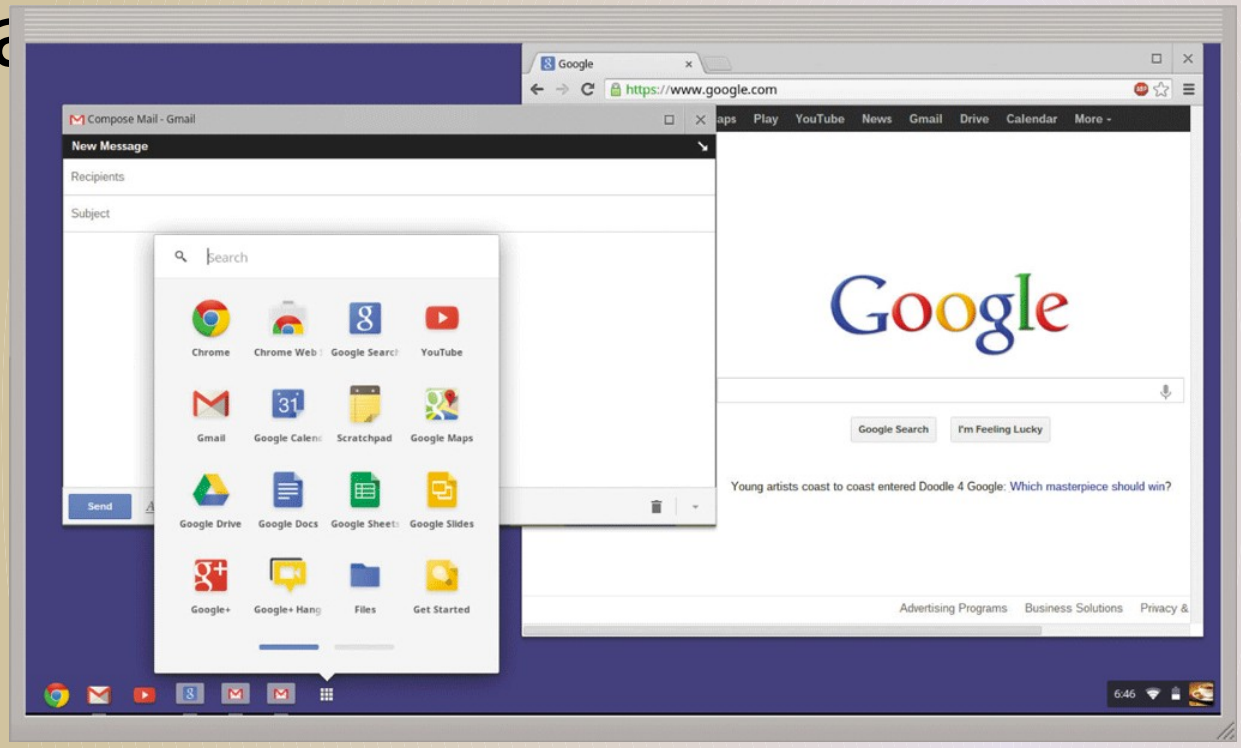

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Figure 9-16

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Server Operating Systems

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Mobile Operating Systems

- The operating system on mobile devices and many consumer electronics is called a **mobile operating system** and resides on firmware

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Mobile Operating Systems

- **Android** is an open source, Linux-based mobile operating system designed by Google for smartphones and tablets

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Figure 9-17

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Mobile Operating Systems

- **iOS**, developed by Apple, is a proprietary mobile operating system specifically made for Apple's mobile devices

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Figure 9-18

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Mobile Operating Systems

- **Windows Phone**, developed by Microsoft, is a proprietary mobile operating system that runs on some smartphones

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Figure 9-19

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Summary

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Chapter 9

Operating Systems

Chapter 9 Complete